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Household Food Insecurity and Associated Dietary and Socio-economic Factors among Pregnant Women of Mid-west Bangladesh

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Authors' contributions

This work was carried out in collaboration among all authors. Author EA Ahmed designed the study and wrote the protocol. Author IJ managed the literature searches, wrote the first draft of the manuscript and performed the statistical analysis. Author FM was responsible for data collection, data cleaning and assisted in literature searches. All authors read and approved the final manuscript.

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ABSTRACT

Purpose: The aim of the present study was to estimate the prevalence of household food insecurity and to determine the dietary and non-dietary factors associated with household food insecurity among pregnant women of mid-west Bangladesh.
Methodology: The study was conducted in four sub-districts of Rajshahi district: Rajshahi Sadar, Godagari, Tanor and Shardah. It was a cross-sectional study which randomly enrolled 150 pregnant women. Household food insecurity among the respondents was calculated with the Household Food Insecurity Access Scale (HFIAS).
Results: The mean age of the pregnant women was 29±3 years. About 76% of respondents were food secure, 23% of respondents were mildly food insecure, and only 1% of respondents were moderately food insecure. Severe food insecurity was not observed among the respondents in Rajshahi. About 17% of respondents were anxious and uncertain about their household food

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supply, about 23% of respondents said that they had to eat foods of insufficient quality and only 1% of respondents replied that they had eaten an insufficient amount of food during the month prior to the study. It was observed that the mean Dietary Diversity Score (DDS) and mean Food Consumption Score (FCS) significantly differed (P < .05) between food secure and food insecure respondents. Meat, fish and poultry consumption were found higher among the food secure respondents but vegetable consumption was higher among the food insecure group. Some socio-economic factors such as household size, respondents' educational status, husbands' educational status, husbands' occupation and monthly household income were significantly associated (P < .05) with household food insecurity of the respondents.

Keywords: Food insecurity; dietary factors; socio-economic factors; pregnant women.

1. INTRODUCTION

About 6–73 % of the population is affected by food insecurity in developed and developing countries [1-7]. In Asia, 6.9% of people have been found to suffer from severe food insecurity [8]. Maternal and child nutrition have been found to be associated with food insecurity [9-10]. Moreover, maternal anemia [11] and maternal mental illness [12-13] are also associated with food insecurity. Household food security is required to maintain adequate nutrition during pregnancy.

Numerous studies have been conducted on household food insecurity and associated factors. No study has been conducted on the food insecurity among the pregnant women of mid-west Bangladesh. Hence, the purpose of the current study was to measure the prevalence of food insecurity among pregnant women in mid-west Bangladesh and find out the factors associated with food insecurity in this region. Various methods have been employed to measure food insecurity [14-16]. The current study used the Household Food Insecurity Access Scale (HFIAS) score to assess food insecurity access.

2. MATERIALS AND METHODS

2.1 Study Area, Study Design and Study Period

The study was conducted in Rajshahi district which is located in the mid-west area of Bangladesh. It was a cross-sectional study which was undertaken from November 2018 to February 2019.

2.2 Sampling Technique and Sample Size

A random sample of 150 pregnant women from four sub-districts of Rajshahi: Rajshahi Sadar, Godagari, Tanor and Shardah. The pregnant women who were included in the study were more than 19 years of age and those who had severe diseases such as HIV or Tuberculosis were not included in the study.

2.3 Data Collection

A pretested questionnaire was used to collect data on socio-demographic and economic characteristics and household food security status.

2.4 Household Food Insecurity Access Scale (HFIAS) Score Measurement

A questionnaire containing nine occurrence questions and nine frequency of occurrence questions, was used to measure the HFIAS score [17]. Several validation studies have been conducted for evaluating the feasibility of this scale to assess food insecurity in different settings [14-19]. In this study, respondents were divided into four categories: Food secure, mildly food insecure, moderately food insecure, severely food insecure, based on the scores. The nine conditions (responses to nine occurrence questions) were combined to create three domains: anxiety and uncertainty of household food supply, insufficient quality of food, insufficient food intake and its physical consequences.

2.5 Statistical Analysis

The statistical analysis was done by IBM SPSS Statistics 21.0. The statistical tools which were used were mean, Pearson Chi-square test, independent samples t-test.

3. RESULTS

3.1 Socio-demographic and Economic Characteristics of Pregnant Women

Table 1 illustrates the socio-demographic and economic characteristics of pregnant women.

About 83% and 15% of the pregnant women were on their second and third trimester, respectively. Only 8% of the respondents got married at an adolescent stage. About 9% of the households had had three members and about 29% of households had five or more than five household members. About 50% of the pregnant women had Honors or Masters degree and about 72% of the husbands had completed Honors or Masters degree. No husbands were found to have an educational status below the Higher Secondary Certificate (HSC). All of the pregnant women were housewives and most of the husbands (79%) were wage earners and about 19% were farmers. About 16% of the households had monthly income of fourteen-thousand to twenty-five thousand taka and 84% of households had income greater than twenty-five thousand Taka. Most of the families (72%) had one earning member and about 28% of families had two earning members.

3.2 Household Food Insecurity Status of Pregnant Women

It can be observed in Fig. 1.a. that about 76% of the respondents were found food secure, 23% were mildly food insecure and only 1% were moderately food insecure. Severe food insecurity was not found among the respondents in the Rajshahi district. Fig. 1.b. depicts the three domains of household food insecurity. About 17% of the respondents were anxious and uncertain about household food supply during the past 4-weeks prior to the study. About 23% of the respondents had to eat foods of insufficient quality that is, they had less variety in their food intake and their food preferences were not fulfilled. Only about 1% of the respondents were observed to eat insufficient food. Fig. 1.b shows that pregnant women of Rajshahi district did not have to consume less food but had to eat a lower variety of food.

Table 1. Socio-demographic and economic characteristics of the pregnant women

Socio-demographic and economic characteristics		Frequency	Percent
Area	Rural	39	26
	Urban	111	74
Age (in years)	23-28	54	36.1
	29-31	56	37.4
	≥32	40	26.5
Trimester	First Trimester	3	2
	Second Trimester	125	83.3
	Third Trimester	22	14.7
Age at first marriage (in years)	18-19	11	8
	20-23	105	63.3
	≥24	34	28.7
Household size	Three	14	9.3
	Four	93	62
	≥ Five	43	28.7
Educational status of respondents	SSC	21	14
	HSC	53	35.3
	Hons.	75	50
	Masters	1	0.7
Educational status of respondents' husband	HSC	27	18
	Hons.	87	58
	Masters	36	24
Occupation of respondents' husband	Business	1	0.7
	Wage earner	119	79.3
	Agriculture	28	18.7
	Others	2	1.3
Monthly household income (in BDT)	14000-25000	24	16
	25001-30000	64	42.7
	>30000	62	41.3
Earning member	One	108	72
	Two	42	28

N.B: SSC = Secondary School Certificate, HSC = Higher Secondary Certificate, Hons.= Honours degree, BDT = Bangladeshi Taka

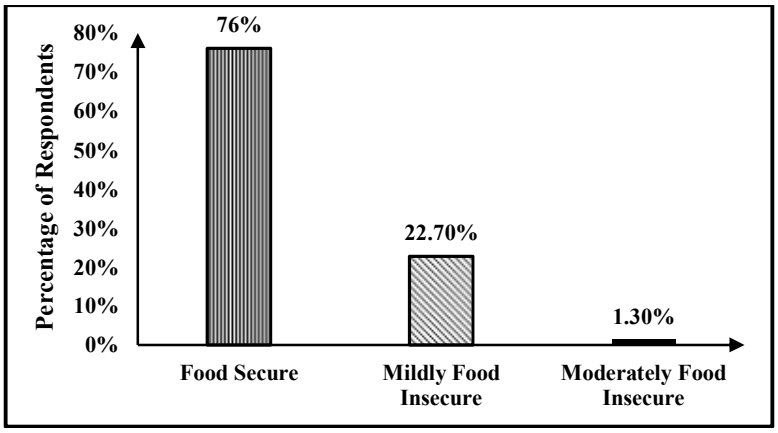

Fig. 1.a. Household food insecurity status of respondents

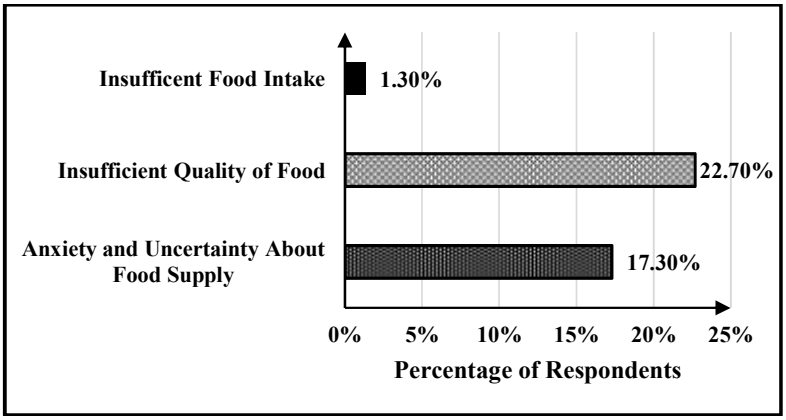

Fig. 1.b. Three domains of food insecurity (Access)

3.3 Dietary Factors and Household Food Insecurity

Table 2 displays the mean differences of various dietary scores between food secure and food insecure respondents (by independent samples t-test) along with the association of different dietary factors and food security status of the respondents (by Pearson chi-square test). The mean Dietary Diversity Score and mean Food Consumption Score vary significantly between food secure and food insecure pregnant women (P<.05). The mean household food expenditure was higher among the food secure group than their insecure counterparts. About 92% of the food insecure respondents reported eating vegetables during the previous day which was significantly higher than the food secure respondents. On the other hand, meat, fish or poultry and milk consumption were significantly higher among the food secure respondents (P < .05).

Table 2. Dietary factors and household food insecurity

Dietary factors	Food secure	Food insecure	P-value
Dietary Diversity Score (Mean ± SD)	6.78 ± 1.54	4.34 ± 1.97	< .05[a]
Food consumption score (Mean ± SD)	65 ± 7.32	60.39 ± 8.15	< .05[a]
Monthly household food expenditure(in BDT)	7053 ± 483	4367 ± 642	< .05[a]
Vegetables consumption (%)	74	92	< .05[b]
Meat, Fish or Poultry consumption (%)	89	54	< .05[b]
Milk consumption (%)	69	48	< .05[b]

N.B.: BDT = Bangladeshi Taka, [a]P-value was obtained from independent samples t-test, [b]P-value was obtained from Pearson Chi-square test

Table 3. Association of household food insecurity and socio-economic factors

Socio-economic factors		Food security (%)	Food insecurity (%)	P-value
Household size	Three	73	4	< .05
	Four	19	14	
	≥ Five	18	82	
Educational status of respondents	SSC	14	54	< .05
	HSC	21	32	
	Hons.	42	9	
	Masters	23	5	
Educational status of respondents' husband	HSC	34	68	< .05
	Hons.	43	32	
	Masters	23	0	
Occupation of respondents' husband	Business	42	22	< .05
	Wage earner	37	14	
	Agriculture	13	54	
	Others	8	10	
Monthly household income (in BDT)	14000-25000	4	73	< .05
	25001-30000	27	21	
	>30000	69	6	

N.B: SSC= Secondary School Certificate, HSC= Higher Secondary Certificate, Hons.= Honours degree, BDT= Bangladeshi Taka, P-value was obtained from Pearson chi-square test

3.4 Socio-economic Factors and Household Food Insecurity

Table 3 shows the association of socio-economic factors with household food insecurity of the respondents. Significant associations were found between household food insecurity and family size, educational status of the respondents, educational status of the husbands, occupation of the husbands and monthly household income (P<.05). It can be observed from the table that household size was positively associated with food insecurity. On the other hand, the educational level of the respondents and their husbands, and household income were negatively associated with food insecurity. Regarding the occupation of the husbands, it can be seen that food insecurity was more prevalent among farmers in comparison to other occupations.

4. DISCUSSION AND CONCLUSION

In Bangladesh, the minimum and maximum HFIAS score have been estimated as 0 and 26 at the national level, respectively [20]. In contrast, minimum and maximum HFIAS scores were found 0 and 12 respectively in our study. Mean HFIAS was found 3.63 in our study, in comparison with a score of 7.45 at the national level in Bangladesh [20]. It was found in this study that about 76% of households were food secure and 24% of households were suffering from mild and moderate level food insecurity. Available literature suggests that about 60% of rural households of Bangladesh have been suffering from food insecurity [21]. In the present study, we found that food insecurity was negatively associated with family size and similar findings were reported in other studies [22,23]. Household food insecurity was also associated with educational status, with similar findings in three other studies [22,24,25]. This study indicated that food insecurity was higher among those respondents whose husbands were farmers and that is in line with the study of Ukegbu et al. who found that food insecurity was higher among farmer headed households [26].

Monthly household income was found to be negatively associated with food insecurity in the current study, which was similar to the result found by Tantu et al. [27]. Dietary diversity and monthly food expenditure significantly varied between food insecure and food insecure respondents in this study. Mulugeta et al. reported that food insecurity is associated with low dietary diversity and Tantu et al. found that a low food expenditure is associated with food insecurity. It might be concluded that the prevalence of food insecurity was found higher among the pregnant women of mid-west bangladesh than the national prevalence. Several studies support the findings of the current study that food insecurity is associated with household size, educational status of

household head, occupation of household head and monthly household income.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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